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CONTENTS.

CHOLERA.

Cholera.—In our last number we stated that it was upon the alimentary canal that the cause of cholera exerted its principal force, and we shall now adduce the evidence which has led us to this conclusion. The symptoms of the disease and post-mortem appearances both sustain this view.

Dr. Goodeve, in his recent excellent article on cholera (*A System of Medicine*, edited by Dr. Reynolds, p. 126), says: "Typical epidemic cholera is characterized, in its developed stages, by vomiting and purging of watery fluid; by rapidly causing a state of the body called collapse, in which there is extreme depression or diminution of nearly all the functions of life; by terminating in death, often within twenty-four hours from the first symptoms of the disease, or in healthy reaction, or in various dangerous sequelæ, mostly of a typhoid nature." Further he states (*op. cit.*, p. 149): "In the *beginning* of an attack the most prominent symptoms are disturbances of the stomach and bowels. Then, in swift succession, though not necessarily in that order, the circulatory, respiratory, muscular, and nervous systems suffer. Then in severe cases ensues extreme depression of all the functions of life, which often terminates in death."

Dr. John Macpherson, late Deputy-Inspector-General of Hospitals, H. M. Bengal Army, who, like Prof. Goodeve, has had large experience in the cholera in India, says ("Cholera in its Home," London, 1866): "An attack of cholera sometimes comes on suddenly, without warning. Oftener there has been more or less discomfort for a day or two, with some diarrhœa, to which, if severe, the name cholerine has been given in France; this is the *early* stage of the disease." * * * "If the premonitory stage is passed or has been wanting, the patient next evacuates the contents of his stomach by vomiting, and then goes on vomiting a watery fluid with

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white flakes in it, and rejects almost instantaneously everything he swallows. Enormous alvine evacuations take place simultaneously with, or often precede the vomiting. They empty the contents of the intestine, and are at first yellow, but soon cease to be so, and present the character known by the name of rice-water motions; they succeed each other with great rapidity, and their smell is characteristic. There is an inexpressible feeling of faintness; the pulse gets accelerated and rises to 120 beats; its strength diminishes in proportion to its rapidity; the beating of the heart becomes weaker; the respiration is anxious and accelerated; the patient complains of dyspnœa, *though examination of the chest shows only altered intensity of sounds.* The voice becomes feeble; it has a peculiar sound which once heard can never be mistaken; there may be swimming of the head or ringing in the ears, incessant restlessness and jactitation of the limbs. Syncope is not common. Painful cramps are felt in the arms, the fingers, and especially the calves of the legs. By this time the patient is so weakened that he must lie down. The face expresses the greatest suffering and anxiety, the features are pinched and shrivelled, and the eyes hollow, with black circles round them. As the disease runs on, the body gets cold, the face often becomes bluish, the fingers become of the same colour, and more especially the nails, while the skin looks as if it had been macerated in water. If you pinch the skin, it retains the impression a long time; all elasticity is gone. The whole body usually becomes thinner from the drain of fluid from the cellular tissue; cold sweats break out; the secretion of bile and of urine is suspended; the urine, from the commencement, has been scanty, and contains albumen.

"In some rare cases the patient remains twenty to thirty hours in this state, and then reaction sets in."

The *respiration* is usually much disturbed and laborious, in some instances so distressing that it could only be compared to the most violent attacks of asthma. The air expired by patients who present the external phenomena of asphyxia contains much less than the usual quantity of carbonic acid, according to Dr. Davy only one-fourth or one-third;[1] and it would appear from the experiments of Dr. Clanny,[1] MM. Guêneau de Mussey,[2] Rayer, and M. Barruel, that the amount is sometimes even less. The last-named gentleman says that he has ascertained that during complete collapse no change was effected in the chemical composition of the air respired—it contained no carbonic acid, and not an atom of oxygen had been absorbed.[3]

The *secretion of urine* is usually lessened as the disease proceeds, and ultimately, in most instances, becomes entirely suppressed.

We have met with two instances, however, in which the secretion of urine was excessive, amounting to almost complete diabetes, and Dr. O'Shaughnessy has seen similar cases. The secretion from the intestinal mucous membrane is here replaced by an increased action of the kidneys. In neither of the instances in which we have observed this form, was there complete collapse, but the debility caused by the discharge was very great—there was extreme lightness of the head, and giddiness, which was aggravated after each discharge of urine. There was also slight diarrhœa, but not the profuse serous evacuation from the bowels observed in other cases.

Purging is the most constant and among the earliest symptoms of cholera.

Dr. Lawrie in his report states, that "of all the patients admitted into the Albion Street Cholera Hospital, Glasgow, there has not been one in whom the disease did not begin in the bowels and stomach. In the vast majority, purging was either premonitory, or the first symptom. Some there were who said that nausea and vomiting first annoyed them, but all had purging early in the disease. In some there was no vomiting; in others no cramps; in a few the pulse, capillary circulation, and respiration were good; but all, to a man, had a discharge of characteristic watery fluid from the bowels. So much am I convinced of this, that I now consider watery purging essential to cholera, and have no hesitation, in my own practice, in pronouncing any disease not cholera in which this symptom is absent. The purging is usually unattended by griping pains. In every case which I have had an opportunity of watching from its commencement, the failure of

[1] Ed. Med. and Surg. Journal.

[1] Cholera of Sunderland.
[2] Gaz. Méd. de Paris, T. iii. pp. 219, 278.
[3] Archives Générales, April, 1832, p. 605.

the pulse, capillary circulation, and other symptoms of collapse, have been in marked proportion to the amount of fluid discharged, the rapidity of its discharge, and its approach to water in colour, consistence, and smell. I know no symptom by which a common diarrhœa or disordered stomach and bowels can be distinguished from the early stage of cholera."—*Glasgow Journal.*

In a few rare cases, nevertheless, purging has been absent; but in such cases the intestines have been found on examination *filled* with the rice-water fluid. We have seen one instance of this; the disease was there complicated with strangulated hernia, and the passage completely obstructed—the bowels were prodigiously distended with the fluid alluded to.

What is termed *cholera sicca* is spoken of by many writers, but we believe such cases to be apocryphal. Dr. John Macpherson (*op. cit.*, p. 57) says: "I have often heard of them, but they have never occurred in my own tolerably extensive experience, spread over twenty-four years. I never knew a case in which there was not some vomiting or purging."

Dr. Gull, in his able report (p. 130), says: "The cholera poison is not known to produce its fatal effects without the characteristic affection of the intestines. Cholera sicca, in a strict sense, does not occur, for although the disease may be fatal without any evacuation, the intestines after death in such cases have been found to contain rice water fluid."

The symptoms of cholera have been so often and fully described that it is unnecessary to dwell further on them; enough has been related to demonstrate that the alimentary canal exhibits the *earliest* and *most serious* manifestations of disease.

Let us now inquire whether the morbid lesions found after death lead to the same conclusion.

There is a remarkable uniformity in the statements of observers in regard to the pathological appearances met with in those who have died of cholera. We have in our library over one hundred and fifty works on the disease, and an examination of them has fully satisfied us, as has also our personal observation, that the only differences noticed result either from accidental complications or from the period at which death takes place—whether it occurs early or later in the algide period, or after reaction.

No constant or marked lesions are found in the brain or nervous system, lungs, heart, liver, spleen, kidneys, or genital organs.

Brain and Nervous System.—Virchow met with no structural changes in the brain and spinal cord; Reinhardt and Leubuscher report the cerebral substance to be healthy, as do most other writers; the sinuses and veins are more or less loaded with dark blood, and the brain substance often presents on section numerous dark red points from fulness of the smaller veins.

The nerves which go off from the brain, medulla oblongata, and spinal marrow, present no alteration at their origin. M. Bouillaud says that he has recently dissected the nerves of the lower extremities, in a patient who had experienced violent cramps, and that he found them in a state of the most perfect integrity.[1]

The phenomenon of cholera appearing to indicate a suspension of function in the *ganglionary nervous system*, many careful investigations have been instituted for the purpose of determining the condition of this system after death. M. Delpech asserts that he found in his examinations evident traces in the semilunar ganglions of the physiological alterations they had experienced; that they were often enlarged, red, more or less injected, and sometimes remarkably softened, and that the blood with which they were injected was red, whilst the blood in the capillary system over all the rest of the body was black. The solar plexus, he says further, was always in a more or less abnormal condition, but always recognizable by the size of the nerves which compose them, often by the red injection of their neurilemma, and sometimes even by the softening of the nerves which form them, so that they break under the slightest effort, or even the least pressure.[2] The researches of Mr. Lizars, of Edinburgh, and M. Halma-Gand, appear to sustain this statement; but the investigations of MM. Gendrin, Bouillaud, Louis, Andral, and indeed of all the Parisian pathologists, are entirely opposed to it.

M. Bouillaud says that the important part which the semilunar ganglion and the plexuses which originate from it are made to perform in cholera, induced him to atten-

[1] Traité du Cholera-Morbus de Paris, &c., p. 266.
[2] Etude du Cholera-Morbus. Par le Professor J. Delpech. Paris, 1852. Pp. 197, 198.

tively examine these parts in almost all the choleraics who died in his hospital practice, and he declares that the ganglionic nervous system did not in a single case present any lesions of structure. In some cases, the ganglions and the plexuses had preserved their normal white or grayish-white tint. But most frequently, he observes—

"The semilunar and cervical ganglions, like many other organs, were of a rose or violet tint, with or without manifest injection; this slight lesion of colour was more evident on the exterior than in the interior of the ganglions."

M. Gendrin found the semilunar ganglions and all the ganglions and nervous plexuses perfectly healthy.

"Their tissue has," he says, "its natural colour and density, if we take care to dissect these so as to prevent the sanguineous imbibition which results from the effusion of blood from the veins which are necessarily divided in the examination. It is however observed, that the nervous ganglions in the bodies of choleraic subjects often present a reddish tint which is often found after many diseases, and constantly in asphyxia."

Lungs.—In a majority of cases fatal in the algide stage, Dr. Gull, in his admirable report (*Report on the Morbid Anatomy, Pathology, and Treatment of Epidemic Cholera*, made to the Royal College of Physicians, London, 1854), states no other morbid change existed in the lungs than engorgement of the lower and posterior parts of these organs with dark blood. In some instances this was so complete as to cause portions of the pulmonary tissue to sink in water. The anterior and superior parts were drier than natural.

Virchow, Briquet, and Mignot, and most observers, found the lungs usually collapsed to the spine and flaccid; the anterior portions free from engorgement; Leudet states "the lungs are commonly healthy;" there is "frequently hypostatic congestion."

Heart.—The *heart*, *arteries*, and *veins*, except in cases of complication, offer no notable lesion. The arteries are nearly empty; in the larger ones, and in places only, a dark, imperfectly coagulated blood, precisely similar to that found in the veins, is met with. The venous system contains a blackish, viscid, semi-coagulated blood, somewhat resembling blackberry jelly. The nearer the vessels are to the heart the greater is the quantity of this black blood which they contain; it is especially considerable in the superior vena cava, the subclavians, the internal jugular, and the vena azygos. The heart, especially its right cavities, are generally gorged with blood similar to that found in the veins. Its proper veins are exceedingly distended with the same kind of blood.

Reinhardt and Leubuscher found in those who died in the algide stage the muscular substance firm, well contracted, and of a dull red colour. The right auricle and ventricle distended with blood; the left contained in proportion but a small quantity.

Liver.—After death, in the algide stage, according to Virchow, "the liver was but little altered; it was for the most part pale and flabby, only the large vessels contained blood. Not rarely the volume of the organ appeared to be diminished. The parenchyma was deeply coloured with bile."

Gull, Briquet and Mignot, Reinhardt and Leubuscher, with most observers, state that the gall-bladder is usually distended with bile, differing little from that usually found in it, often viscid, but sometimes more watery than natural; the gall-ducts not obviously affected.

The spleen is usually small, with no obvious change in the tissue, beyond that arising from want of blood, giving its capsule a wrinkled appearance. (Gull, Niemeyer, Leudet.)

The *kidneys* are unaltered in their tissue, but exhibit on section venous hyperæmia. The secreting structure rarely presents any obvious morbid change, but the urine is sometimes albuminous before its suppression. The contents of the pelvis are mostly turbid, with exfoliated epithelium and free nuclei. (Gull, Virchow, &c.)

The *urinary bladder* is, in the algide stage, mostly contracted and empty; sometimes hyperæmic, especially about the neck, and covered with a layer of exfoliated epithelium. (Gull, Briquet, and Mignot.)

The genital organs present no constant morbid phenomena. (Virchow, Leudet, Gull.)

Alimentary Canal.—Through the *whole extent of the alimentary tube*, from the pharynx to the anus, there is *constantly* found after death, marked lesions, varying only according to the period at which the patient has succumbed. When death occurs early, either from feebleness of constitution in the

victim, or from the violence of the attack, the mucous membrane is found in a state of hyperæmia to a greater or less extent, with punctated or arborescent redness and with enlargement of all the mucous follicles.

If death occurs later, the hyperæmia has often disappeared, the mucous membrane has become pallid, softened, and denuded to a greater or less extent of its epithelium, as first pointed out by the late Prof. Horner, of the University of Pennsylvania, and since confirmed by many other observers. It is the debris of the epithelium which constitutes the flocculi so characteristic of cholera evacuations.

Dr. Charles T. Jackson, who attended the pathological examinations of Professor Wagner at Vienna, states that "the uvula, tonsils, and pharynx were covered with granulations, as also the base of the tongue." "These granulations," he adds, "vary in size from that of a pepper-corn to that of a pea, and are probably the mucous follicles altered by inflammation." Mr. Fergus, who attended the dissection of two hundred cholera subjects by Professor Wagner, states that the mucous membrane of the pharynx was often of a deep purple from injection of its vessels. "The mucous membrane," he adds, "seemed always, in acute cases, as if swollen in its whole extent; from place to place it was a bright red from numerous vessels."—*Lancet*, June, 1832.

The mucous membrane of the stomach is covered with a tenacious mucus, largely mixed with exfoliated epithelium, and over its whole circumference it presents a multitude of small, white granulations, slightly grayish, having a very regular hemispherical projection. These granulations have no regular arrangement, and everywhere disseminated, they are still more numerous in the duodenum and jejunum than in the stomach. M. Serres says that they are so numerous and developed in the small intestines that the whole mucous membrane seems as if made up by them;[1] their number decreases towards the large intestines. On dissection these granulations are found to be the follicles of Brunner distended by a white, turbid fluid, and three times their natural size. This development of the follicles of the mucous membrane appears to be constantly met with in the early stages of the disease, even when death occurs within twenty-four hours.

"The isolated follicles, or the glands of Brunner," says M. Bouillaud, "are those particularly which we observe more or less tumefied and developed; nevertheless it is not uncommon to meet at the same time that lesion in the plates of Peyer or the clustered follicles. This hypertrophy, this species of erection of the follicles of the mucous membrane of the digestive tube, prevails sometimes through the whole extent of this immense membrane; and this gastro-intestinal eruption, sometimes distinct, at others confluent, imitates to a certain extent the variolous eruption in its first stage. The number of follicles developed, when the eruption is confluent, is truly incalculable. We will only say, that any one who has seen this kind of eruption, will not consider the calculation of M. Lélut, by which the whole number of follicles in the alimentary mucous membrane is estimated at forty-two thousand, to be exaggerated. The size of these follicles thus tumefied varies from that of a small millet-seed to that of a hemp-seed. Their form is rounded and granular. Many of them have a blackish point at their centre. There are some which do not offer this character, and MM. Serres and Nonat, who have published some researches of great interest on the subject under consideration, think, as is known, that these granulations are not follicles, but *intestinal papillæ* in a state of tumefaction. We have studied with some care this point of pathological anatomy; and we are certain that an immense majority of the granulations with which the mucous membrane is covered, are really enlarged follicles, but we will not affirm that those on the summit of which there is no perceptible black point, and which marks the opening of follicles, are actually the same. The colour of follicular granulations is commonly a grayish-white; at their basis a more or less considerable injection is frequently met with."

Mr. Fergus, to whom we have already referred, states, that in those patients who "had died after a few hours' illness, the glands of the pharynx and back of the mouth, those of the intestines, from the cardia to the anus, were much, but simply, enlarged; those of Brunner were elevated above, and stood clear out from the mucous membrane; those of Peyer were raised

[1] Gaz. Méd. de Paris, tom. iii. p. 206.

about half a line or a line, and their surface was uneven. They were always of a pale colour, and of a uniform texture when cut into; they stood in no relation whatever to those parts of the intestine where congestion had taken place; but they seemed to have some connection with the production of the thick mucus, because the glands were most developed in those subjects and in those places where this mucus was most abundant. When the contents of the canal were more fluid, these glands were no longer so distinct."—*Lancet*, June, 1832

Incipient ulcerations are also occasionally met with in the intestinal follicles.

The whole intestinal tube is generally more or less distended with a whitish, turbid fluid similar to that discharged by vomiting and stool, and which fluid is pathognomonic of cholera. In the stomach, besides the choleraic fluid, there is found usually a very considerable quantity of glairy mucus, more or less adherent to the mucous membrane; sometimes in place of this a layer of creamy matter is found similar to that hereafter to be noticed as met with in the intestines. M. Bouillaud says that he has several times seen in the stomach a yellowish or greenish bile.

Among the pathological changes found on post-mortem examination, that in the *blood* is most striking. Its consistence is much greater than normal, and its colour very dark. Its specific gravity was found by Dr. Garrod to be from 1068 to 1081, while the maximum of healthy blood, according to Becquerel and Rodier, is 1062 (*London Jour. Med.*, vol. i. p. 409.) Reinhardt and Leubuscher observe "the blood contained in the cavities of the heart was in the majority of cases coagulated into a dark homogeneous mass, with fibrinous coagula extending into the large vessels. Virchow's statement that these coagula contained a large number of colourless corpuscles, was confirmed by our own observations. The large venous trunks, and the veins of individual organs, were full of blood, whilst the arteries and capillaries were for the most part empty. This fulness of the veins was more marked in cases where death followed quickly upon the commencement of reaction after the cold stage."

The investigations of Dr. Garrod (*op. cit.*) on the blood have led him to the following conclusions:—

"1. That in cholera the physical characters of the blood are altered, and its tendency is to become thicker, tar-like, and less coagulable.

"2. That the proportion of water is much diminished.

"3. That the specific gravity of the serum is very high, which is due to the increase of the solid portion of the serum, and especially of the albumen; and that this fluid also tends to become less alkaline in its reaction.

"4. That with regard to the salts of the serum, some doubt exists as to their excessive diminution.

"5. That urea sometimes exists in cholera blood."

The analyses of Professor Hermann, of Moscow, of MM. Rose and Wittflock, of Berlin, and of Dr. Clanny, of Sunderland, also show that there is a great deficiency of water in cholera blood.

The experiments of Dr. Rayer show that the serum of cholera blood is less alkaline than that of healthy blood;[1] and Dr. O'Shaughnessy states that it is nearly or entirely deficient in its alkaline ingredients. "Of the free alkali contained in healthy serum," he says, "not a particle is present in some cholera cases, and barely a trace in others."[2] M. Lassaigne, of Paris, in his chemical examination of choleraic blood, found it to contain only a fourteenth of the usual quantity of fibrin.[3]

This change in the condition of the blood does not occur however early in the disease. This has been most conclusively shown by Schmidt,[4] and also by Dr. O'Shaughnessy, who availed himself of the second eruption of cholera in London, to repeat his chemical inquiries relative to this disease, on a most extensive scale, and with a view, if possible, to decide the important question, whether the alteration of the blood be primary or secondary, and to ascertain what are the conditions of the blood in the several stages of the disease. His investigations show, that—

"1st, in the *premonitory* symptoms, no alteration of the blood exists; 2d, in the cases in which the evacuations are trivial, and *cramps* form the prominent symptoms, the blood is also unaltered; 3d, the altera-

[1] Gaz. Méd., iii. p. 347.
[2] Lancet, Dec. 31, 1831.
[3] Traité Pratique, &c. du Cholera-Morbus, par J. Bouillaud, p. 224, note.
[4] Characteristik der Epidemischen Cholera. Leipsic, 1850.

tion of the blood consisting in loss of water and saline matter, only occurs in the collapse cases *preceded* by excessive rice-water evacuations; 4th, this alteration of the blood gradually disappears, or increases in the fever stage, according to the aggravation or amelioration of the symptoms."—*Lancet*, Aug. 1832.

Dr. Clanny also found the quantity of water in the blood scarcely at all diminished in the *incipient* stage of cholera, and Mr. Prater says, that in four cases in which he examined the blood in this stage, that fluid seemed to redden, contract, and to contain the ordinary proportion of water. The change in the blood then *occurs late* in the order of symptoms.

The character of the *evacuations* in cholera is deserving of attention. The following are the results obtained by Dr. Clanny, from an analysis of the dejected fluid: Water, 989; fibrin, 6; carbonate of soda, 3; animal extractive, 2; total, 1,000. (*Op. cit.*, p. 112.)

According to Dr. O'Shaughnessy, "all the salts deficient in the blood are present in large quantities in the peculiar white dejected matters."[1] MM. Rose and Wittflock, of Berlin, and Dr. Kirk, of Greenock, also state the dejections to be alkaline. The existence of fibrin in the dejections is shown also by the analyses of Dr. Christie in India,[2] and Dr. O'Shaughnessy.[3]

The greatest quantitative loss, as observed by Dr. Goodeve (*loc. cit.*, p. 160), "which the blood suffers is in its watery element. For every 100 ounces passed in the fluid evacuation stage, the loss to the blood is in water 98 to 99 ounces, and of salts nearly or about one ounce. The salts exuded are the chlorides of sodium and potassium, phosphate of soda, carbonate and sulphate of soda, bearing a proportion of seven or eight parts in 1,000, a proportion nearly resembling the quantity in the blood within the vessels. The earthy phosphates do not pass through the mucous membrane as in health."

"It will be seen," he further observes, "that the intestinal surface removes from the blood a large quantity of water, a small quantity of animal matter, and much saline matter; doubtless causing great change in the blood and in the behaviour of the different elements of the blood to each other."

[1] Lancet, Dec. 31, 1831.
[2] Observations on Cholera, p. 52.
[3] On the Chemical Pathology of Cholera.

The influence which the water in the organism exercises on physiological phenomena, and the prejudicial results which follow from its loss, is not generally fully appreciated. Robin and Verdeil have shown that water is an anatomical element of the system. Bernard asserts it to be an essential component of all living organisms—that it is the necessary vehicle for the materials which enter into the double movement of nutrition and excretion, *without which life cannot be maintained*. "Independently of their special properties," M. Bernard remarks, "the organic fluids are allied by a general character; all owe their first physiological importance to the water they contain; before being useful in consequence of the substances which they hold in solution or in suspension, they are first useful as fluids."

There is little ground for surprise, then, that the loss by the blood, in cholera, of so large a portion of its most important element should be followed by disastrous consequences—that life cannot, under these circumstances, be any longer maintained. The condition is worse than after hemorrhage, for in the latter the blood in the system, though deficient in quantity, is normal in quality, while in cholera the blood is no longer suitable for the physiological functions of maintaining life.

The chemistry of the vomited matters has been less investigated.

A question which would have been regarded as of more importance formerly than at the present time, is, whether the secretions into the intestinal canal are the result of inflammatory action, or a passive serous hemorrhage, or osmosis. Dr. Gall (*op cit.*, p. 118) seems to us to take the correct view of the subject, in stating that "an examination of the fluids effused from the mucous membrane gives no evidence of active plasmatic changes taking place in them. On the contrary, the large amount of fluid thrown out, its low specific gravity, and its other physical characters, indicate an almost passive exosmosis, as through a dead membrane."

A study of the symptoms of cholera seems to us to show that the essential phenomena of the disease, those, alone, always present, are uneasy feelings of some description in the abdomen, with the discharge by vomiting or stool of a thin fluid; and that when the disease runs a fatal

course, the only symptoms constantly superadded are, alteration in the blood, sinking of the circulation, coldness and blueness of the surface, and lessening or suppression of most of the secretions. In its simplest form, then, cholera consists in a disorder of the digestive tube, with discharge of a thin rice-water like fluid. Let us now inquire how the phenomena we have indicated as superadded, in fatal cases, result from this primary disorder of the alimentary canal.

The thickening of the blood is at once accounted for by the profuse evacuations into the digestive canal, which chemical analysis has shown to consist principally of water, and as all the secretions are derived from the blood, this fluid, thus deprived of its water, necessarily becomes thickened.

The alteration of the colour of the blood arises to a certain extent, probably, from its imperfect circulation, since it has been shown by Professor Hassenfratz,[1] that arterial blood soon acquires the characters of venous, if it be not kept in constant contact with the air, and Mr. Prater says that he is quite satisfied from his own experiments of the correctness of this statement. The main cause of the blackness of the arterial blood would, however, appear to be an incapacity of reddening by the contact of oxygen arising from the loss of its saline matter and serum. Messrs. Stevens, Rayer, and Prater have found that it never fails to redden immediately on immersion in saline solutions.

The sinking of the circulation arises from two causes: 1st. The choleraic evacuations suddenly and largely diminishing the amount of circulatory fluid, must, like profuse hemorrhages, weaken the action of the heart; and 2d. The thickening and viscidity of the blood caused by the abstraction of its fluid portion presents a mechanical obstacle to its circulation.

[1] Annales de Chimie, tom. ix.

[2] The debility occasioned by the watery evacuations from the bowels, the thickening of the blood arising from the same cause, and the mechanical obstacle which this condition of the blood offers to its circulation, are especially noticed by Morgagni in his invaluable work on the seats and causes of diseases. His own case, which he denominates a serous diarrhœa, and others of the character to which he allludes, were essentially the disease under consideration. We recommend to the attention of the profession that portion of his thirty-first letter in Book III., which treats of "Fluxes from the belly without blood."

The coldness of the body is a necessary consequence of the suspension of the circulation, and from the same circumstances, joined to the black colour of the blood, arises the livid or dark tint of certain portions of the body.

The deficiency of water in the blood, and also the law of the animal economy that the augmentation of one secretion produces a proportional diminution in others, explains the diminution or suppression of the urine and various other secretions.

Such seem to us, as indicated by the symptoms, to be the series, relation, and physiological explanation of the essential symptoms of cholera.

The post mortem appearances concur fully with the symptoms during life in showing the essential lesion in cholera—the one never absent in the disease—to be an effusion upon the inner surface of the intestinal tube of a serous fluid, containing the debris of exfoliated epithelium, which is afterwards rejected by vomiting or purging;[2] and that this fluid is the product of an alteration equally constant, at least in its early stage, which alteration consists in the development of the secretory follicles disseminated over the digestive tube.

The exaggerated secretion of the intestinal follicles must have been necessarily preceded by an afflux towards these follicles, and it must also be necessarily accompanied by that state of turgescence of the secretory organs accompanying all augmented secretions—an active state to which Bordeu has called the attention of physicians, and of which post-mortem examinations have always shown the traces when death has not occurred too late.

This fluxion towards the follicles of the digestive tube is among the earliest effects of the cause, whatever it may be, productive of cholera, and is manifestly the result of the well-known law, *ubi irritatio, ibi fluxus*. Starting from this orgasm of the follicles alluded to, we have little difficulty in showing how the phenomena of cholera follow as natural results.

These follicles gradually increase in size under the influence of this fluxion to them, their secretions are augmented, and thus is produced the *serous diarrhœa* which constitutes the initiatory stage of cholera. As soon as the secretion is increased in the whole digestive tube, to a sufficient extent to quickly substract from the blood a large

portion of its elements, the choleraic symptoms appear. Previous to this, the loss which the blood suffers is slight, and absorption repairs it continually. Thus, the intensity of the general symptoms is, *cæteris paribus*, in proportion to the *suddenness* of the serous secretions. A person in whom these secretions occur slowly, suffers less at the end of three or four days, although he may have lost a large quantity of serum, than another would at the termination of an hour, in whom the deperdition has taken place suddenly, even though he had lost less serum. For the same reason the disease becomes very speedily fatal in those who have scarcely any discharge by vomiting or stool, but whose alimentary tube is suddenly filled by the product of the secretion, and this especially in persons whose vital powers are enfeebled by previous disease, irregular habits, &c.

Debility, coldness of the extremities, feebleness of the pulse, oppressed respiration, and syncope, are the immediate results of all sudden losses of blood; it is quite intelligible, then, how they occur in a disease in which the blood is suddenly deprived of its most essential elements;[1] they also occur in excessive serous diarrhœas, and in ordinary cholera.

The blood deprived of its water by the profuse secretions into the bowels, becomes thickened; and in proportion as it is rendered thick and viscid, and the propulsive power of the heart is enfeebled by the excessive choleraic secretion, will the circulation be diminished. The diminution of the circulation through the lungs causes derangement of respiration—the blood deprived of its saline matter by the secretions in the bowels, the oxygen of the air cannot effect in it those changes which this agent ordinarily produces upon it in the lungs;[2] the proper changes of the blood in the lungs being thus imperfectly and ultimately not at all effected, the portion of this fluid which reaches the left side of the heart is similar to that sent to the lungs by the right side of that organ. The suspension of the general circulation and the dark colour of the blood produce a blueness or bronze colour in those parts in which the thinness of the skin permits the colour of the blood to be partially seen—as occurs in asphyxia. The circulation being suspended, animal heat can no longer be generated, and hence the body becomes cold. The profuse secretion into the intestinal canal is effected at the expense of the water of the blood, which creates a demand upon every part of the system which can supply this waste. Hence the muscles, cellular tissue, &c., are deprived by absorption of their watery constituents, causing a shrivelling of certain parts, as of the fingers and toes, sinking of the eyeballs, &c. This same condition is also observed in some profuse hemorrhages; our esteemed friend, the late Professor Dewees, notices it as occurring in uterine hemorrhage. Thus are the phenomena of collapse produced.

In some cases the profuse secretions from the bowels are arrested, or diminished, either spontaneously, or from the effect of remedies. So long as the profuse secretions from the bowels continue, it is impossible for the absorbents to repair the loss which the blood sustains; these evacuations being arrested, the blood is then thinned by the water taken up by the absorbents, becomes gradually fitted again for circulation in the vessels; and the addition of saline matters derived from the same source restores to that fluid its capacity to undergo the proper vital alterations in the lungs. Reaction is thus produced. The immediate result of this reaction is to repair the disorders occasioned by the intestinal secretions. The excessive secretory action of the gastro-intestinal mucous membrane ceasing, the other secretions, as those of urine, of bile, &c., are again re-established.

The difficulty to the establishment of reaction is proportional to the extent of the lesions in the gastro-intestinal mucous membrane, and to the alteration which the blood has undergone; and the evils which follow this reaction result, at least in great measure, from this change in the blood. The brain here suffers more than any other organs, except the digestive, because the venous circulation is carried on in it by a peculiar apparatus, which renders the progression of the blood slower and more difficult, and which thus easily leads to congestions. This congestion persists notwithstanding the reaction, if the viscid and semi-coagulated blood of the sinus

[1] Gendrin, p. 136.

[2] The experiments of M. Rayer and others show that the presence of salts in the serum is necessary for the blood to be oxygenizable, and consequently that the chemical phenomena of respiration may be effected.

presents an obstacle to the re-establishment of the cerebral circulation. Congestion is reproduced in the reaction, probably because while there is an augmentation of the activity of the arterial impulsion in the brain, the circulation through the sinuses is still retarded.

Such is the anatomical history of the essential lesions in cholera. It now remains for us to explain certain symptoms and lesions, which, although not essential to the disease, are nevertheless of very frequent occurrence.

The principal seat of the disease, as has been, we think, conclusively shown, is the gastro-intestinal mucous membrane. In this membrane four functions are performed, viz: 1st, secretion on its free surface (by the glands of Peyer and Brunner, and probably by its villi); 2d, nutrition (interstitial deposition and removal); 3d, innervation; and 4th, absorption from its free surface. The essential lesion in cholera we have found to be that of the secretory function, productive of a great increase in secretion and an alteration in the fluid secreted; and the loss, to a greater or less extent, of the epithelium of the mucous membrane. It is rare, however, for any function of this membrane to be seriously impaired, without the others being involved to a greater or less extent in the derangement. We have therefore usually, in cholera, derangement of the nutritive function, producing thickening, softening, &c., of this membrane.

The function of innervation is also frequently deranged. This is shown by the intense heat in the epigastrium, urgent thirst, &c. When the irritation is sufficiently intense to be transmitted to the cerebro-spinal system, we have spasms of various muscles. Examples of spasms produced by irritation of the alimentary mucous membranes are furnished in convulsions so frequently caused by the presence of worms or indigestible matters, or of irritating poisons in the intestines. Or this spasm may be caused by the depraved blood supplied to the brain and nervous system.

The function of absorption is lessened and probably absolutely suspended during profound collapse. Extract of belladonna has been given during this condition to the extent of 22 grains without any effect being observed from it. (Clark, in *Med. Rec.*, p. 732.) The excessive loss of water by the blood being no longer repaired by absorption, the secondary effects resulting from the change in the state of the blood ensue. When the secretions abate, or are arrested, which frequently occurs, often even in perfect collapse, the absorbents slowly supply to the blood the materials it has lost; the watery fluid it supplies renders the blood more fluid, and fit for circulation; the saline matters it supplies, restore to the blood its capacity for undergoing oxygenation. The mode in which reaction is effected, has not hitherto been explained. We have ventured to attribute it to the supply of water and saline matters to the blood, furnished by the absorbents, and we do not hesitate to believe it to be the true one. We can produce the same effect by injecting saline solution into the veins. The functions, it is known, do not all cease together, the organs die in succession. The function of absorption is among the last to die; it often continues hours after the external phenomena of life have ceased. In one specimen of blood taken from a cholera subject some time *after* death, M. Lassaigne found nearly the same quantity of serum that is contained in healthy blood.[1]

Mr. Prater says that sometimes in cholera the circulation begins after the respiration has ceased, the person being apparently dead. A remarkable case of this kind, he adds, occurred at Newcastle.[2] The increase of temperature after death is owing to the same cause; it is an attempt at reaction. We may here remark that the muscular contractions after death are to be explained on the same principle. Vitality remains in the nervous system, producing muscular contraction after the respiratory and circulatory organs have ceased to perform their functions.

Further evidence of the correctness of these views is furnished by the effects of agents whose mode of action is acknowledged to be that of irritants when applied to the mucous membrane. Thus an overdose of most of the drastic purgatives, and several of the acrid poisons, eating putrid fish, &c., produce effects strikingly analogous to the phenomena of cholera. Mr. Christie states that one of his servants took an over-dose of croton tiglium, which occasioned hypercatharsis, with mucous and se-

[1] Bouillaud, Traité Pratique, &c., p. 224, note.
[2] Experimental Inquiries in Chemical Physiology, p. 249.

rous evacuations; his pulse became scarcely perceptible at the wrist; his extremities cold; his features contracted; and all the symptoms so strikingly resembled cholera, that Dr. Christie supposed him to be labouring under that disease until the case was explained. (*Op. cit.*, p. 14.) Dr. Christie produced all the symptoms of cholera in dogs by introducing tartar emetic into their stomachs; and we have seen similar effects in the human species from an over-dose of the same article. Elaterium, scammony, hellebore, and other articles of the same class, in excessive doses, often occasion a similar train of symptoms.

It is well known that the symptoms of poisoning by arsenic and other *acrid* poisons so closely resemble those of cholera, that it is often extremely difficult, and sometimes even impossible, to distinguish them. This close resemblance is pointed out in all the works on medical jurisprudence, and has been particularly noticed by Christison, one of the most authoritative writers on the subject. (*On Poisons.*)

In fact, we have, from the action of this class of poisons, vomiting and purging of a fluid similar to that discharged in cholera, spasms, darkness and coldness of the skin, feeble pulse, suppression of urine and other secretions, &c. (*Christison.*)

Finally, a confirmation of the correctness of our views is furnished by the class of persons most obnoxious to cholera. Thus we find it is individuals whose gastro-intestinal mucous membrane is in a state of excitement, or irritation, from the excessive use of spirituous drinks, from the ingestion of indigestible food, &c., who are the most frequent subjects of cholera. In such persons also the course of the disease is rapid—the primary stages are scarcely observed. The reason of all this is evident. The first effect of the choleraic poison is to irritate the digestive mucous membrane, and to establish a fluxion to it. Spirituous liquors, indigestible food, produce the same effect; their action is in the same line, then, with the agent producing cholera. Drunkards, those who indulge in indigestible aliment, then, have their gastro-intestinal mucous membrane in a state of irritation—they are in fact in a condition nearly identical with the first stage of cholera—such persons are known indeed to have habitual diarrhœa. Irritation of the digestive mucous membrane, with its consequences, an afflux of blood to the part being established, in such persons, on the addition of the influence of the cause of cholera, increased osmosis is at once induced, and the phenomena of the second and third stages of the disease promptly appear. That the disease should be generally fatal in the class of persons under notice, is not surprising; they usually fall victims to any disease with which they may be attacked.

The analysis of the symptoms, the order of their occurrence, and the post-mortem appearances—the effects of agents on the alimentary mucous membrane, whose action is known to be irritating—and various facts in the history of the disease, all tend to prove that cholera is an irritation of the gastro-intestinal mucous membrane, always directed to the secretory apparatus of this tissue, and often involving the functions of nutrition and innervation of the same tissue.

The varieties which are observed in this disease arise from the degree in which these several functions are deranged, and to the extent and the portions of the alimentary mucous membrane in which the irritation predominates. The degree to which the functions of nutrition and innervation are involved, appears in a considerable degree to be dependent on temperament. Thus it is observed that in persons of sanguineous temperament, the manifestations of increased secretion, whilst in those of nervous temperament, those of lesion of innervation, as spasms, predominate.

The peculiar fatality of this form of gastro-intestinal irritation depends upon the extent of that irritation, usually from the pharynx to the anus; and to nearly all the functions of the tissue being involved—secretion, nutrition, and innervation.

Such is the outline of what appears to us to be the true pathology of cholera, as we presented them to the Philadelphia Medical Society in the autumn of 1832, and which was published in the *Cholera Gazette* of Nov. 21, of that year. We have now reproduced it with slight alterations and additional evidence in its support. After the reflection we have since given to the subject, it still appears to us to be in entire accordance with all the facts that have been observed, to leave none of the phenomena of the disease unaccounted for, and to lead, moreover, to the only mode of treatment that can claim any success.

Dr. Johnson's Eliminative Treatment of Cholera.—In our last number, p. 103, we noticed a remark of Prof. Johnson's which we regarded as a virtual abandonment of his eliminative treatment of cholera. In a more recent article (*Med. Times and Gazette*, June 16, 1866), there is a further admission which we consider to the same effect, and shows that the Professor has been driven to great straits in defence of his doctrine. He says:—

"I am aware that many practitioners cannot think of giving a purgative to a sufferer from cholera without a feeling of dread. I am sure that this dread is mainly the result of an imperfect apprehension of what a purgative is intended to do and of what it actually does. The disease is usually attended with a profuse drain of fluid from the blood. *To increase that drain would be mischievous, and might be fatal.* A few doses of castor oil do not increase that peculiar excretion which constitutes the purging of cholera. I know that they do not, by actual observation; and if we look a little closely into the matter, we shall see that an ordinary purgative cannot have the effect which is so much dreaded."

Purgatives, then, according to Prof J., are *not really* eliminative. He may well ask, "what, then, is the object to be attained by emetics and purgatives in cholera?" "The object is," he says, "to stimulate the stomach and intestines to eject their morbid contents, which otherwise might be retained and absorbed."

This is restricting his views of elimination within very narrow limits, and castor oil is only required in those cases in which the bowel is "over-distended and paralyzed by its accumulated contents," and the "choleraic secretions are but slowly and imperfectly discharged without the aid of some artificial evacuant."

Castor oil is therefore not to be given as an eliminant to eliminate a poison from the system, but simply as an evacuant to empty the bowels of their contents when nature fails to do this, which is surely only in exceptional cases.

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Progress of Cholera.—Cholera prevails at various points along the North of France, from Penmarch (Finistère) and Nantes, in the extreme west, to Hesdin and Courcelles-Chaussey. At Amiens it has raged with great intensity. It has also broken out at Lisle. At Bordeaux several cases are reported. Some villages in the Meurthe and of Moselle have been severely visited. Cases have occurred in Paris, but it is not epidemic there.

It has invaded Holland with great intensity, prevailing in Rotterdam, La Haye, Delft, and Amsterdam.

On the 2d of May it broke out at Brussels. At Antwerp, on the 3d of July, from 40 to 50 persons died in the 24 hours.

The latest files of newspapers from the Hague give a long list of the communes in which the epidemic had appeared, and show that up to the 9th of June the attacks in them had amounted to 2,410, the deaths to 1,352. The following returns are also given from the commencement of the outbreak to the 22d of June, 1866:—

	Attacks.	Deaths.
Leyden, . .	1,021	649
The Hague, . .	362	215
Delft, . . .	542	319
Rotterdam, . .	824	503
Dordiecht, . .	346	196
Gouda, . . .	143	73
Utrecht, . .	688	382

According to the *Wiener Med. Wochenschrift* the cholera is widely spreading in Germany.

At Berlin, on July 2d, 39 cholera cases were reported, 15 of which terminated fatally. The total cases from June 16 is 129, of which 79 were fatal.

It is now epidemic in many parts of Pomerania. In Stettin, where it has assumed a threatening character, there have been since the beginning of June 537 cases and 294 deaths.

The disease is said to have broken out at St. Petersburg.

In England the disease has been imported into several ports on the east coast, and it has again appeared on the south coast. It it evidently spreading, though not yet epidemic.

In the United States cases of cholera have occurred at various places, but nowhere can it be said to prevail extensively as an epidemic.

In the city of New York between the 1st of May and the 25th of July the number of deaths from cholera is stated as 56. During the week ending July 21st, there were 11 deaths reported from cholera, and during that ending July 28th, 48.

In Brooklyn the number of deaths from cholera during the week ending July 28 was 42.

On Ward's, Hart's, Governor's, and Blackwell's Islands in the New York Bay, the disease is said to be prevailing very extensively.

In Jersey City, Elizabethtown, and some other towns in New Jersey, cases have occurred.

In Philadelphia during the past three weeks 32 deaths from cholera have been reported, of which number 19 are reported for last week.

A severe outbreak has occurred among some soldiers who had just arrived from Hart's Island, New York, and landed at Tybee Island, near Savannah, Georgia. At last accounts (July 28th), the number of deaths is said to be 146.

Five cases had also occurred at Galveston, among troops just arrived there from Hart's Island, New York.

CLINICS.

Transfixion of the Base of the Tongue by a Needle; Diagnosis and Removal with the Aid of the Laryngoscope.—The following case, admitted into Westminster Hospital under Dr. Gibb, strikingly illustrates the valuable aid afforded by the laryngoscope in discovering foreign bodies lodged in the throat:—

"Mrs. Annie D., aged seventy-six years, was admitted as an out-patient on May 19th, under Mr. Power, with the impression that she had a pin in her throat. He transferred her to Dr. Gibb for examination by the laryngoscope. She stated that she resided at Dulwich with her daughter, and that two weeks ago she swallowed a pin with some pudding. She felt it prick the throat right across, followed by severe pain, particularly on the left side, and dysphagia. Every now and then she had a choking sensation, with a disposition to retch. On the 13th (Sunday) she became nearly frantic with suffering, and the next day she retched continuously for nearly an hour. She had lived upon slops since the accident, and could only get them down by sipping small quantities. Her sufferings had been so severe that she had become exceedingly weak and feeble, and she was nearly suffocated on her way to town.

"Nothing could be detected externally. The neck was thin, and all the structures were easily distinguished. There was some tenderness across the hyoid bone, especially on the left side, where indeed there was a little tumefaction. In that situation the neck had been much swollen shortly after the foreign body was lodged, but this had subsided to a great extent. The voice was quite natural.

"In the fauces nothing was seen with the unaided eye, but on the tongue being held out and the laryngeal mirror introduced the black point of a needle was seen emerging from the base of the tongue on its left side, near the lateral edge of the epiglottis, and occasionally coming in contact with it to the extent of about two lines. The needle had evidently penetrated the left side of the sac of the pharynx, transfixed the tongue's base in that situation, been driven through its structure, and emerged in the situation described.

"Any attempt at removal, without some guiding point, would have been futile. Dr. Gibb, therefore, made the patient protrude her tongue out of her mouth with firmness and resolution. He then introduced the mirror with his left hand, and with the right inserted a pair of curved forceps capable of holding the minutest body with unusual tenacity, and succeeded in getting hold of the point of the needle, which he pulled outwards towards the right side, and brought out of the mouth. On examination, it was found perfect, quite black, and an inch and a half long. All symptoms of discomfort immediately subsided, and the patient left for her home, expressing herself in terms of gratitude and thankfulness for relief, after what she described as such 'horrid suffering and misery.'

"In some clinical remarks which Dr. Gibb offered upon this case, he observed that it might be taken as an invariable rule that pins were seldom discoloured, whereas needles were always black—an important point in the diagnosis when a portion only of the foreign body was seen with the laryngoscope. The patient's voice and breathing were natural; and although there were occasional attacks of dyspnœa and retching, yet beforehand it could be seen that the larynx was not in any way involved. The dyspnœa, and perhaps the retching, were due to the occasional contact with the edge of the epiglottis. He had recorded several cases in his own experience of the

removal of pins and other substances, both from the larynx and fauces. In one case a pin had become lodged within the larynx of a gentleman, the head of which was situated in the hollow of the anterior angle of the thyroid cartilage, whilst its point transfixed the right arytenoid cartilage. Symptoms of the most violent strangulation were present, and suffocation was imminent, until removal was accomplished, when they vanished, as it were, by magic. He doubted whether the patient in that instance would have been saved by even opening the trachea, unless the pin had been removed at the same time. In the generality of cases perfection of voice and breathing pointed to freedom of the larynx; but when the body could not be felt by the finger, and then removed, the employment of the laryngoscope afforded great assistance in diagnosis."—*Lancet*, June 30, 1866.

Necrosis of the Lower Jaw from Application of Tobacco Oil to a Hollow Tooth; Removal of Dead Bone.—Smoking has long been a popular remedy for toothache, and we believe the sailor's quid enjoys a still greater reputation as a local application under these trying circumstances. In the case to which we now refer, the unfortunate patient, through his application of the remedy in a highly concentrated form, set up inflammatory action, which destroyed a large portion of his jaw.

An Italian sailor was placed, under the influence of chloroform, upon the operating table on the 26th ultimo. Just under his left lower jaw the skin was ulcerated, and there was a sinus communicating with dead bone. Mr. Paget removed several of the teeth, and then, without making any incision, contrived, with the aid of a strong forceps, to remove several sequestra representing a portion of the base, the angle, and a large part of the ascending ramus of the left lower maxilla.

From Mr. Paget's remarks, we gathered that the man, just previous to starting from Australia three months ago, suffered very much from a carious tooth. To relieve the pain, he introduced into the hollow some of the oil of tobacco which had accumulated in the stem of his pipe. Violent inflammation of the periosteum and of the surface of bone was set up, ending in death of the osseous tissue. Mr. Paget remarked, incidentally, that there was great uncertainty as to the period at which sequestra were removable. As a general rule, the more acute the necrosis the more rapid the separation of the fragment; so that within three months of acute necrosis one might expect to find the sequestrum loose, as was the case in the present instance.

The case well illustrates a source of danger which is not generally recognized. The practice of smoking is very widely spread, and foul pipes, as well as carious teeth, are very common. Every smoker of a pipe has been disgusted now and then by sucking into his mouth a few drops of the highly pungent and nauseous product of the combustion of tobacco. In the action of smoking, the tip of the tongue ordinarily receives this deleterious fluid, and is very often blistered in consequence. Were it not for the tongue, one can readily imagine that hollow teeth would often receive this fluid; with what amount of risk the case before us well shows. It is well known that for phosphorus to excite the inflammatory action which so often affects the lucifer-match workers the fumes must be applied to a raw vascular surface in immediate connection with the nutrition of bone. This almost always happens through the medium of a carious tooth. There is no reason to suppose that tobacco oil would set up inflammation except under similar circumstances. It is, however, very probable that some cases of acute necrosis of the lower jaw, of obscure origin, may have really originated from the accidental poisoning of tooth-pulp by this liquid; and the possibility of this source of disease should be borne in mind.—*Lancet*, June 23, 1866.

MEDICAL NEWS.

DOMESTIC INTELLIGENCE.

Health of Philadelphia.—In our last number we stated that the general mortality, as well as that from the prevailing diseases of the season (bowel complaints), was less than usual. Since then, as will be seen from the following table showing the mortality for the last four weeks with that of the corresponding weeks of last year, a marked change has taken place. Not only has the mortality from bowel complaints largely increased, but during the week ending July 21, the general mortality reached the unprecedented amount of 716; of which as many as 50 were from

sunstroke. This may be with probability ascribed in part to the unparalleled heat experienced during that period, and this conclusion derives support from the fact that with the diminution of heat during the past week the mortality has decreased to 472, which is not a great many more than that of the corresponding week of last year (427). The deaths from bowel complaints have likewise decreased from 238 the previous week to 167 last week.

	Mortality from						
	Cholera Infantum.	Diarrhœa.	Dysentery.	Cholera Morbus.	Total from Bowel Affections.	Total Mortality from all Diseases.	Sunstroke.
1866.							
Week ending July 7,	57	6	2	4	69	324	5
" " " 14,	101	18	11	13[1]	143	472	10
" " " 21,	168	14	25	31[2]	238	716	50
" " " 28,	101	10	17	39[3]	167	472	7
1865.							
Week ending July 8,	112	19	23	4	158	438	
" " " 15,	101	20	23	4	148	453	
" " " 22,	75	18	33	3	129	443	
" " " 29,	76	27	35	2	140	427	

Medical and Surgical History of the Rebellion.—The Surgeon-General has published extracts from letters received from some of the most eminent surgeons and physicians strongly eulogistic of Circular No. 6, and urging the importance of the publication of the valuable materials collected in relation to the Medical and Surgical History of the War. It would be almost criminal not to render these materials available for the cause of humanity and science.

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American Medical Association.—The Prize Essay Committee of the American Medical Association request that all communications to be submitted to them be sent to their Chairman before the 15th day of March next, accompanied by a sealed envelope containing the name and address of the authors. The Association offers two prizes of one hundred dollars each, for the best two essays on any subject connected with the medical sciences. F. Donaldson, *Chairman;* W. Chew Van Bibber, Josiah Simpson, Edward Warren, C. C. Cox.

Baltimore, June 25, 1866.

N. B. The medical journals throughout the country will please insert the above.

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Massachusetts Medical College.—At the commencement of Harvard University, on the 18th July, the degree of M. D. was conferred on thirty candidates.

Dr. Austin Flint's Treatise on the Principles and Practice of Medicine.—The very favourable reception which the recent Treatise on the Principles and Practice of Medicine by our countryman, Dr. Flint, has everywhere met with, not only at home, but also abroad, is extremely gratifying. The *Lancet*, a journal not usually disposed to judge favourably of our cisatlantic publications, in a recent No. (June 23d), notices Dr. Flint's treatise in the most complimentary terms. The reviewer states that "in the plan of the work and the treatment of individual subjects there is a freshness and an originality which make it worthy of the study of practitioners as well as students. It is, indeed, an admirable book, and highly creditable to American medicine. For clearness and conciseness in style; for careful reasoning upon what is known; for lucid distinction between what we know and what we do not know, between what nature does in disease and what the physician can do and should; for richness in good clinical observation; for independence of statement and opinion on great points of practice, and for general sagacity and good judgment, the work is most meritorious. It is singularly rich in good qualities and free from faults. Dr. Flint does not care from what source he derives material for the formation of

[1] Of these 10 are reported simply cholera.
[2] Of these 19 are reported simply cholera.
[3] Of these 18 are reported simply cholera.

opinion, and he is always explicit in his statement of the source. He defers greatly to physiologists and chemists, but has a keen perception of the point at which they cease to help the physician; and beyond this point, and in the absence of these guides, he comes to the best opinion to which his long and close clinical observation enables him to come." * * *

"We are sorry to be unable to draw more largely from Dr. Flint's book. We are sure that a more minute acquaintance with it, which we would recommend our English readers to make, will lead them to concur with us in the very high opinion of it which we have expressed above."

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Citizens' Association of Pennsylvania.—An Association has lately been chartered under this title, the object of which is to inquire into the causes of the rapid increase of pauperism, vagrancy, crime, and intemperance, and to institute measures, if possible, that shall lead to improved legislation concerning them, and to a better state of public morals and safety. The Association has just issued an address calling attention to their objects, and urging the formation of branch associations in the various towns and counties of the Commonwealth, and in the different wards of our cities, to aid in the accomplishment of their purposes.

Another important sphere of labour is the "purchase of lands and erection of buildings for the cure of the intemperate," and to this latter end the action of the Board of Directors is especially directed at the present time.

It is proposed "to offer the means of recovery, if possible, to those who may desire to accept them, and to place those means within reach of the friends of such as may be lost to the desire for good. It is not the intention to erect a large and forbidding edifice, with even the appearance of a public charity, a reformatory or penal establishment, but a series of cottages, where the domestic idea and habits of the family may be observed and perpetuated. Homes to which persons may go without any compromise of their self-respect, subjecting themselves only to such treatment and discipline as their condition may require, and where the allurements of literature and art may be secured to them, with a hope of restoring and improving the taste for the good and the true. These homes will be erected in the country, and we will endeavour to make them as attractive in situation and external surroundings as possible."

To carry out this most philanthropic and useful project, the Association appeal to their fellow-citizens for sympathy, co-operation, and pecuniary contributions.

Three hundred thousand dollars will be required to completely carry out the plan, but so soon as fifty thousand are paid a commencement will be made, for, according to the plan proposed, a few can very soon be placed under treatment.

We most earnestly commend this project to the favourable consideration of the public. Contributions may be sent to Dr. Jos. Parrish, or to either of the directors, or to the Provident Life and Trust Company, No. 111 South Fourth Street, Philadelphia.

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Prize of the Medical Society of the State of Pennsylvania.—A distinguished member of the profession, whose name we are not authorized to divulge, has placed into the hands of the Treasurer of *The Medical Society of the State of Pennsylvania* the sum of twenty-five dollars, which will be awarded to the author of the best essay on any subject pertaining to the science of medicine or surgery. The essay must be forwarded on or before the first day of May, 1867, to either of the "Standing Committee," consisting of Drs. James King, of Pittsburg, B. R. Mowry, of Alleghany City, and Prof. Traill Green, of Easton, and must be considered, in the united judgment of said committee, worthy of a prize. Each competitor is also required to affix a motto to his paper, and to accompany it with a sealed envelope having inscribed on it the same motto, and inclosing the author's name. The seal of the essay to which the prize may be awarded shall not be broken until the next annual meeting of the Society, to be held at Pittsburg, Pa., on the second Wednesday of June, 1867, when the name of the author will be announced. The other essays, upon application, will be returned to their respective authors, with the envelopes unopened.

FOREIGN INTELLIGENCE.

Diagnosis of Pregnancy.—M. Mattei, in a recent communication to the Imperial Academy of Medicine, stated his conviction that pregnancy may be accurately diagnosed

during the first four months by combined deep-seated abdominal palpation and vaginal exploration. He asserts that in this way pregnancy may very often be pronounced upon positively at the end of the first month, almost always at the end of the second, and always during the third and fourth months, unless some exceptional circumstances, which are of exceedingly rare occurrence, are present. The principle upon which this statement is founded is that the uterus cannot be gravid without alteration in its size and without presenting special anatomical and physiological modifications. Another important fact which M. Mattei says he has demonstrated, is that the gravid uterus in four instances out of five is in a state of anteversion, and in once out of five or six times in retroversion, being rarely maintained in the straight line. Each of these positions has its special signs month by month, and which have been studied by M. Mattei by aid of palpation and vaginal *toucher*. For example, in anteversion he has found that the uterine fundus is on a level with the pubes from the end of the first month, or even before that period. When the uterus remains straight or is retroverted, the diagnosis can only be made from the third month. M. Mattei gives rules for the production and perception of the uterine *ballottement*, which is to be distinguished from the fœtal.

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Menstruation and Abortion at 72 years of Age.—Dr. Priou mentions this case in the *Bulletin de la Société de Médecine d'Angers:* The patient, seventy-two years of age, began menstruating at sixteen, married at twenty-eight, and had six children, the last of whom she bore when she was forty-eight. She suckled this child, and saw no catamenia afterwards.—*Lancet*, April 7, 1866.

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Degeneration of the Human Race from residing in Crowded Cities.—There can be little doubt that about the great centres of civilization man is carrying out his sociable tendencies to such an extent as to detract considerably from the enhancement of his personal welfare, looked at in a physiological or medical point of view. He has become so fond of his neighbour, and his neighbour so fond of him, that they are almost inseparable. Their friends are in the same way of thinking, and hence all join company and form compact fraternization. But the consequence is, that they are in too close contact, and so continuously add to their number that at length they scarcely allow themselves room to move. There is no fresh air for them; they are forced to breathe their own and their neighbours' exhalations over and over again. There are so many of them in so small a space that they cannot well get rid of their refuse matters, scarcely of their own excreta. If anything in the shape of an infectious disease attacks one, it spreads like wildfire, of course, amongst the others; and even moral delinquencies are found to be in the same way catching, for if a "black sheep" gets among the flock, it is well known that "evil communications corrupt good manners." If the consequences, then, of this social agglomeration be, on the one hand, increase of political power, of wealth, of commercial and social prosperity, and successful competition with other nations, they are, on the other, an overtaxing of the physical and mental energies at our disposal, and a premature consumption of national life-blood. To see all this we have but to scrutinize the character and results of that which has been called in recent days the "great town system." To witness it in perfection we should observe the effects of this system on the physical condition and modes of life, particularly of the industrial poor of a great city. If we do this it will certainly be found just as the honorary secretary of the Manchester Sanitary Association and physician to the Salford Hospital assures us is the case.[1] There will be observed, as he states, amongst this class a singular want of stamina manifesting itself either in the gait, bearing, voice, or frame. The muscular system is rarely fully developed or well strung. Few men are of that calibre from which we might expect either vigorous or healthy offspring, or arduous and sustained labour. Cases of deformity, along with actual distortion, are far from unfrequent, while minor physical defects, many of them denoting no trifling constitutional ailments, are deplorably common. The pulse, telling of the power of the heart, assures us the great central organ of the circulation is weak and flabby. The extremities are often cold in the younger

[1] The Danger of Deterioration of Race from the too rapid increase of Great Cities. By John Edward Morgan, M. D., &c. London: Longmans.

people; the veins prominent and tortuous in the adult, and the elders complain of vertigo. Blanched lips and colourless cheeks are common to men as to women, whilst hysteria and neuralgia are to be met with under protean and abundant forms. In fine, the blood is proved to be impoverished, and the nervous system devoid of that well-balanced tension on which the easy and harmonious working of the whole system so mainly depends. In the children of this class, again, the teeth are no sooner developed than they begin to decay; enlarged glands protrude from the neck; the skin looks dry and parched; the hair scanty, scrubby, or withered. If we extend our inquiries, we shall find too that of the number of military recruits derived from the population of our great towns, nearly four out of five fail to come up to that standard of bodily fitness which the army medical referees are instructed to insist on.—*Lancet*, June 23, 1866.

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Antagonism of Race to Race.—When alluding to the influence of the antagonism of race to race in the production of the recent Jamaica rebellion, we pointed out how difficult it was for peoples of different origin to become amalgamated in social character and civilized economy. Here lies a difficulty as great as with their physical aspect and confirmation, in which they will ever remain distinct so long as they do not mix much together in marriage. And when this latter circumstance happens, a mixed breed ensues, incapable of maintaining itself as a fertile established race, but ever merging into one of its original stocks; the rapidity of the return, and the selection of the parent, being dependent on well-known circumstances unnecessary now to mention. Too often this divergency of race from race tends to such periodical outbursts of one against the other as we have of late years witnessed in India, the Gulf of Mexico, South America, New Zealand, and the Cape. It matters little who begins the business, the defendant becomes as eagerly pugnacious and exterminative as the plaintiff when once the gauntlet is thrown down.—*Lancet*, March 24, 1866.

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Suicides in Vienna.—During the month of April there were sixty-five attempts at suicide at Vienna, thirty-six of which ended fatally. Forty-seven of them were committed by men, fifteen by women, and three by children from nine to fourteen years of age. Twenty-two persons hanged themselves, eleven took poison, five cut their throats, two shot themselves, and seven died of self-inflicted stabs.—*Lancet*, June 9, 1866.

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Cattle Plague.—Dr. J. Burdon Sanderson has discovered that the blood of the animal affected with cattle plague contains the poison of the malady, so that serum obtained from it will give the disease by inoculation. "This fact," say the Commissioners, "is the most important pathological discovery yet made in cattle plague. It is pregnant with consequences in medical doctrine; for though the existence of a similar fact has been long suspected in several human diseases, it has never been proved in any."—*Lancet*, June 30, 1866.

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International Medical Congress.—The preliminary steps have been taken for the assembling in Paris, at the time of the Universal Exhibition, in 1867, of an International Medical Congress. With this view a central committee has been formed at Paris, who have elected the following officers: *President*, M. Bouillaud; *Vice-Presidents*, MM. Denonvilliers, Gavaret, and Tardieu; *Secretary*, M. Jacoud; *Treasurer*, M. E. Vidal.

This scheme has been sanctioned by the French government, and the Paris committee are preparing the rules and programme of the Congress, which they promise to communicate so soon as determined on. In the mean time we cheerfully comply with the request made to us, to make known the project, and ask the co-operation of the profession in this country.

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Discovery of a Mammoth.—At a late sitting of the Academy of Sciences a letter was received from M. de Baer, of St. Petersburg, announcing that a mammoth, still covered with its skin and hair, had been discovered in the frozen soil of Arctic Siberia. This discovery had been made in 1864 by a Samoyede in the environs of Taz Bay, the eastern branch of the Gulf of Obi. The news only reached St. Petersburg towards the end of 1865; but as the bodies of large animals will keep a long while in those regions, if they are not completely uncovered, and as this mammoth

was still inclosed in the frozen soil, the Academy of St. Petersburg has, with the aid of the Russian Government, sent M. Schmidt, a distinguished palæontologist, to examine the animal and its position in the locality. It is hoped M. Schmidt will arrive before the decomposition is too far advanced, and that a correct notion may be obtained of the outer appearance of the animal, and also, from the contents of the stomach, of its natural food. The pre-historical figure of the mammoth drawn on a piece of ivory, found in a cavern of Périgord by M. Lartet, will then admit of verification.—*Med. Times and Gaz.*, April 28, 1866.

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Unequal Justice.—The following remarks were lately made by the Judge sitting at the Old Bailey to a prisoner convicted of receiving money on false pretences, the pretence being that he was an attorney. The sum received was altogether only £47, and the prisoner obtained it by pretending that he would conduct some Chancery business for the prosecutor. The Judge's speech shows the severe manner in which our law punishes a man for pretending to be an attorney, while it does not punish him at all for pretending to be a physician or a surgeon. The law evidently supposes that it is a criminal act for a man to presume to conduct a lawsuit without possessing a legal qualification, but that it is quite immaterial for an unqualified man to pretend to cure diseases and to defraud the public of their money under this pretence. The quack attorney, it will be seen, is utterly ruined, his wife and children are reduced to beggary, and he is (as a lenient sentence) imprisoned and kept to hard labour for four calendar months; the quack doctor, under precisely similar circumstances, would have been triumphantly acquitted, under the direction of the judge, and on his retirement from the dock would have been, in all probability, received with shouts of acclamation by the multitude.—*The Medical Press and Circular*, Feb. 7, 1866.

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Visit of the French Empress to the Cholera Hospitals at Amiens.—Great excitement has been created in France by the visit of the Empress Eugénie to Amiens The cholera has been raging there to such an extent that the assizes were indefinitely postponed. Eighty deaths a day have been recorded, and it is said that no medical records exist of any European city having been so devastated by cholera as Amiens has been for the last three weeks. The Empress arrived in Amiens at half-past ten in the morning, and then proceeded to the Hôtel Dieu, visiting all the cholera wards, and thence proceeding to the various charitable refuges, &c., thus passing the whole day. Whatever practical utility there may be in such a visit, there can be but one opinion as to the noble self-devotedness, sympathy, and courage that prompted it. It is said that when complimented by a French marshal on the courage displayed by her on this and a previous similar occasion, her Majesty replied, "Monsieur, c'est notre manière d'aller au feu." The Municipal Council of Amiens have voted an address of gratitude to her for her visit, and ordered that a commemorative medal in gold should be sent to her. The last sanitary report gives forty deaths by cholera on Monday.—*Lancet*, July 14, 1866.

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The Great Prize in Electricity.—The French Government has issued an invitation to the *savants* of all nations to compete for the prize of 50,000 frs. which will be decreed five years hence to the author who shall have discovered the means of rendering Volta's pile economically applicable to manufactures as a source of heat, to illumination, to chemistry, mechanics, or practical medicine. The *concours* will remain open for five years, dating from April 18, 1866.—*Med. Times and Gaz.*, April 28, 1866.

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International Ophthalmological Congress.—The meeting of this Association, which was to have convened in Vienna in August of this year, has been postponed on account of the war existing now in Europe.

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Obituary Record.—Died in London, July 8th, 1866, Joseph Toynbee, Esq., F. R. S., aged 51; well known by his extensive and valuable contributions to Aural Pathology and Surgery. He met with his death accidentally while prosecuting his experiments, by inhaling a combination of chloroform and prussic acid.

The Death of the Baroness Dupuytren, widow of the illustrious surgeon, is announced in late French journals. She had reached a very advanced age.

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